



US Army Corps
of Engineers®

Engineer Research and
Development Center

Digital Topographic Support System – Light

Description and Background

Combat commanders at all levels need timely and accurate terrain information and data about the battlefield if they hope to control the action upon it. There also is a need for quick turnaround, map-size, multicolor reproduction of this topographic information to support mission planning and the Commander's decision-making process. The **Digital Topographic Support System-Light (DTSS-L)** is designed to meet these needs.

The DTSS-L has upgraded these capabilities with newer, more capable, **commercial-off-the-shelf (COTS)** technology including Windows-based computer workstations, printers, scanners, and supporting peripherals. The DTSS-L uses the ERDAS Imagine image processing and ESRI's ArcInfo geographic information system (GIS) COTS software packages combined with a customized user interface and enhanced terrain analysis software.

System



The DTSS-L is housed in an Army standard S-788 Lightweight Multipurpose Shelter (LMS) and mounted on an Army High Mobility Multipurpose Wheeled Vehicle – Extended Capacity Version (HMMWV-ECV). The DTSS-L defines the objective configuration of the DTSS, providing the Army with a degree of flexibility, transportability, and mobility not found in the legacy DTSS or the DTSS-Heavy, which were designed to a 5-ton truck as the prime mover. All Unix-based DTSS-Hs have been removed from the field and will be replaced by the Windows-based DTSS-Ls as part of a five-year cyclic upgrade that will be completed in FY04-FY05.

The first 20 DTSS-L mission support equipment includes an Army Common Hardware Software 2 (CHS 2) Sun Ultra-2 workstation with a 20-inch flat panel display, a ruggedized portable Sun workstation, two Hewlett Packard 755C plotters, a 256 GB RAID storage device, and various associated peripheral devices. The remaining production systems (V2-V4) use CHS 2 Windows workstations with dual processors, HP 1000 series printer/plotters, IDEAL scanners, and two RAIDs ranging from 512 GB to 1.4 TB. Fifth production year DTSS-Ls (V5) and V1 upgrades are scheduled for FY04. V1 upgrades will have a commercial workstation while V5s will still have the CHS workstation. The same LMS shelter is being used throughout production and the V1 upgrades will receive replacement shelters. A common software suite will be used in the DTSS-L and DTSS-D, with specific versions of that package developed for the specific workstation employed.

The DTSS-L is configured for communications with other **Army Battle Command Systems (ABCS)** over the ABCS LAN using either fiber optic or copper wire, and includes secure and commercial voice telephone capabilities. The DTSS-L is tactically mobile and designed for worldwide transport by air, road, rail, and sea.

Key Capabilities

The DTSS-L is a tactical combat support system capable of receiving, formatting, creating, manipulating, merging, updating, storing, retrieving, and managing digital topographic data, then processing these data into hardcopy and softcopy topographic products. The DTSS-L accepts topographic and multispectral imagery data from the **National Imagery and Mapping Agency (NIMA)** and from other sources where available.

DTSS-L functional capabilities include creation of a variety of **tactical decision aids (TDAs)** including: (1) Visibility/Line of Sight, (2) Mobility, and (3) Data Query/Special Product analyses. TDAs generated on the DTSS-L can be output as map products that include all applicable marginalia. These overlays can be exported in various formats for use on systems that use viewers such

as **Command and Control Personal Computer (C2PC)**, **ABCS**, and **Commercial Joint Mapping Toolkit (C/JMTK)**.

In addition to custom TDA generation, the DTSS-L provides access to the full capabilities of the image processing and GIS software packages. ERDAS Imagine image processing software is being used to process commercial, NIMA standard, and national digital imagery in order to perform imagery rectification, image map generation, thematic layer generation, limited digital database creation, and 3-D terrain perspective viewing.

The DTSS-L provides updated map background and terrain intelligence information to systems on the battlefield directly by populating and managing the **Map Server**. The DTSS-L also accepts terrain intelligence and data from other ABCS systems. The most recent DTSS-L to be fielded is the V4 (FY03), which houses a Map Server with a 1.4 TB RAID and an Optia Windows server to store and manage this data. By the end of FY04, all fielded DTSS-Ls will contain Map Servers upon completion of the V1 upgrades.

Current Status

The **Program Management Office, Combat Terrain Information Systems (PMO CTIS)** fielded twenty DTSS-Ls (V1) in FY00 with the First Digital Division (FDD) receiving the first 5 DTSS-Ls. Sixteen additional DTSS-Ls (V2) were fielded in FY01, and sixteen more (V3) were fielded in FY02. Current plans call for the total production of 83 DTSS-Ls. Therefore, a follow-on production contract for 31 more DTSS-Ls (16 (V4s) and an option for 15 (V5s)) was awarded in January 2002; the option was exercised in December 2002. Four systems of the follow-on contract were delivered to the field in July 2003, 2 systems were delivered to Germany (510th) and 2 systems were delivered directly to Baghdad, Iraq (526th), in August 03. Also during August 03, in preparation for **Operation Iraqi Freedom (OIF)**, DA directed that the **Stryker Brigade Combat Team (SBCT-1)** at Ft. Lewis, WA, be given their (5-year cyclic) upgraded DTSS-L (V1) ahead of schedule. Software updates and enhancements will be made over the life of the system and (normally scheduled) hardware upgrades will occur on a 5-year cycle.

Milestones

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| Prototype DTSS-L Delivered | Sep 1996 |
| Testing | Sep 1996-Apr 1997 |
| Milestone III Decision | Jan 1998 |
| Production Contract Awarded | Mar 1999 |
| Production Option Year 1 Awarded | Dec 1999 |
| First Production Unit | Jan 2000 |
| First Article Test | Jan 2000-Apr 2000 |
| First DTSS-L Delivery | Jun 2000 |
| Initial DTSS-L Fielding | Aug 2000 |
| Production Option Year 2 Awarded | Dec 2000 |
| Follow-on Production Contract for 31 Systems Awarded | Jan 2002 |
| Production Contract Option for 15 Additional Systems Exercised | Dec 2002 |
| Follow-on Systems Fielded to Germany & Baghdad, Iraq | Jul-Aug 2003 |
| SBCT-1 Received 5-year Cyclic Upgrade | Aug 2003 |
| Upgrade DTSS-H to DTSS-L | FY04-FY05 |

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